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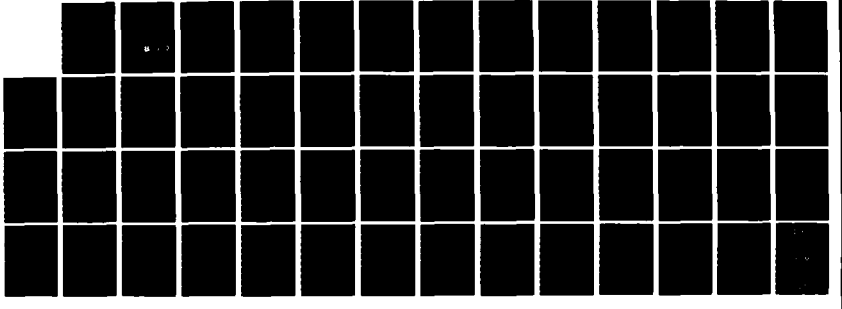

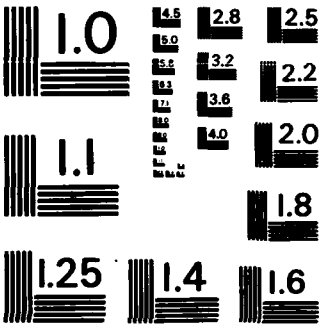

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AIR FORCE GEOPHYSICS LABORATORY MANAGEMENT INFORMATION SYSTEM DEVELOPMENT PLAN

By

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INFORMATION SYSTEMS MANAGEMENT
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As part of a plan to modernize computer operations and services, the Air Force Geophysics Laboratory (AFGL) is implementing a management information system (MIS) for AFGL top- and middle-level managers.

This document specifies the plan and schedule for implementation of the AFGL MIS. The approach to the MIS implementation, system architecture, and functions of the previously defined implementable subsystems are stated. Tasks are identified and scheduled.

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SECTION 1

INTRODUCTION

The Air Force Geophysics Laboratory (AFGL) is planning implementation of a Management Information System (MIS) for its top- and middle-level management. MITRE conducted a study to define the AFGL current and future MIS requirements, recommending that AFGL implement an MIS, beginning with creation of a Development Plan to schedule tasks and resources.

1.1 BACKGROUND

The Director of Information Resources Management (RM) at AFGL initiated a plan to modernize the computer operations and services that it furnishes. One goal of modernization was to provide AFGL managers and scientific and technical staff with automated tools and capabilities to better perform their work. Installation of a local area network (LAN) began during FY83 and terminals were procured for use throughout AFGL. An operational database was designed and developed to accept, store and report financial data that is monitored by the Technical Operations Branch (XOR).

In addition, MITRE conducted a study for the RM Director during FY84 to evaluate the AFGL requirements for an MIS. The findings, published in a MITRE Technical Report (MTR9338) in June 1984, showed that out-of-date, inaccurate data is being supplied to AFGL managers due to inefficient, labor-intensive management information processing. This document contains an AFGL MIS Development Plan that is a prerequisite to the implementation of the MIS functions defined in the report.

1.2 MIS GOALS

The goals of the AFGL MIS are to:

- Provide AFGL top- and middle-level managers with accurate and timely data to more efficiently and accurately track their programs;
- Provide superiors of AFGL management with current and accurate information;
- Coordinate program and administrative activities;

- Streamline manual processes to assist in scientific and technical work;

- Provide access to accurate data and the requisite tools to plan and forecast future programs at AFGL.

1.3 ASSUMPTIONS, LIMITATIONS AND EXCLUSIONS

Certain assumptions, limitations and exclusions were previously defined in the AFGL MIS Study (MTR9338). Those assumptions that are appropriate to the Development Plan are as follows:

The MIS will operate on the AFGL Digital Equipment Corporation (DEC) VAX-11/780 computer(s). Analysis of other types of computer mainframes will not be performed. The impact on computer usage as a result of the implementation of an MIS will be assessed by the RM Director, based on current and anticipated hardware configurations and scientific as well as administrative software use.

DEC VT-1xx type terminals, International Business Machines (IBM) Personal Computers (PCs), and Zenith Z-100 Personal Computers (PCs) have been identified as the standard MIS terminals. Application and utility software packages, such as DEC All-in-One and SuperComp-Twenty, are currently installed on the DEC VAX-11/780; these tools will be used as part of the MIS implementation.

It is assumed that current AFGL financial systems, such as Job Order Accounting System (JOCAS), Management and Scientific Information System (MASIS), Standard Base Level Accounting System (General Accounting), Standard Base Supply System (SBSS) and Equipment Maintenance and Management System (EMAS), will continue to be used without major modification. Some modification to those systems is planned, however, for timely access to the MIS data.

The Lexitron word processing systems and other word processors currently installed at AFGL will continue to be used and will be included in any proposed word processing plans.

Other assumptions, limitations and exclusions that govern the scheduling of the Development Plan include:

The RM Director will choose between Oracle Corporation's ORACLE Relational Database Management System and Relational Technology, Inc.'s INGRES; both of these database management systems are currently installed in Air Force product divisions. The product divisions have been charged with establishing one standard DBMS that will be procured by AFGL. DBMS packages will not be evaluated further as part of the AFGL MIS implementation.

Investigation of phototypesetting equipment as part of a text management system will be predicated on a determination by AFGL whether such equipment is allowable in the AFGL complex.

The Local On-line Network System (LONS) will not be considered as part of the MIS architecture at the present time.

1.4 APPROACH

The AFGL MIS study identified specific tools and capabilities to be implemented to satisfy user requirements. A preliminary investigation has determined that the most efficient approach to installation of these tools and capabilities will be through:

- Installation of a DBMS to store and supply MIS data;
- Procurement of off-the-shelf software and hardware products wherever possible;
- Development of customized software development to meet needs that cannot otherwise be met.

The implementation approach will be to first make maximum use of program information that is already in place and, through the implementation of tools, provide management with access to and manipulation of that data. The conversion of data from current data files to the selected DBMS will be implemented, followed by the populating of the database to provide management with new reporting and manipulation capabilities.

1.4.1 Evolutionary Approach

A multi-phased implementation approach has been chosen to provide services to the system users as quickly as possible without interrupting current service. Implementing tools and capabilities one at a time will allow the end users to become competent with that capability and adjust to newly established procedures gradually.

An evolutionary approach will also permit tighter controls to be maintained over the management of the MIS implementation project. With the use of a phased development approach, concurrent development and implementation activities will allow more effective use of MIS project resources.

1.4.2 Hardware and Software Development Approach

The MIS will be developed using a combination of commercially available off-the-shelf software package installations, existing software and custom software developed in-house at AFGL. When appropriate, turnkey systems comprised of off-the-shelf hardware and software will be procured and installed. The policy will be to develop as little custom software as possible, to minimize time, cost, and resources needed for the MIS implementation.

SECTION 2

FUNCTIONAL SCOPE

Five distinct subsystems have been identified as components of the AFGL MIS. The scope of each subsystem is defined below.

2.1 FINANCIAL REPORTING SUBSYSTEM

The Financial Reporting Subsystem will provide AFGL top- and middle-level managers, program coordinators and division administrators with accurate and timely reports of program initiations, commitments, obligations and expenditures. This subsystem will also provide division-level entry of financial data, such as Work Unit (WU) data, purchase request (PR) data and MASIS data into the MIS database.

Data will be automatically extracted from current systems that process AFGL financial data -- including JOCAS, General Accounting, SBSS and EMAS -- and stored in the MIS database. Data from the MIS database will be automatically supplied to interfacing systems, such as MASIS. Reports will be developed to provide information for program and administrative management. Redundancy in data entry -- a characteristic of current financial systems -- will be eliminated. (For example, time sheet information will be posted once; in the current process it is posted twice monthly: once for the labor system and again for JOCAS.)

On-line sessions will be developed to provide source data entry for WU, PR, Temporary Duty (TDY), Supplies and Equipment (S&E), MASIS and other financial and technical program data. The division users will enter the program data via automated terminal sessions. The data will be sent to the appropriate administrative organization, i.e., the Technical Operations Branch (XOR) or Materials Services Branch (SUM) for processing. Electronic communications between the divisions and the administrative areas will be provided.

2.2 MANAGEMENT REPORTING SUBSYSTEM

To support AFGL managers' requirements to report program status information to top-level management, the Management Reporting Subsystem will make available current financial and technical data that can be accessed and manipulated for presentation. Capabilities will be provided to develop, store and produce briefing sessions in several media, including vugraphs.

Timely and accurate financial and technical data will also be made available from the MIS database, replacing information now manually supplied, for use in the semi-annual Technology Management Review (TMR) Work Unit Assessments. Reports containing TMR information will be produced and appropriate data will be made available to MASIS.

2.3 PROGRAM CONTROL AND COORDINATION SUBSYSTEM

The Program Control and Coordination Subsystem will provide managers with capabilities to communicate, monitor and organize program activities, provide automated access to recording and tracking program and administrative information, and provide automated suspense capabilities. This subsystem will provide managers with an automated mechanism to track non-financial areas of program activity, such as contractor compliance, in-house and contractor technical report publications, unsolicited proposal status, personnel status and inventory records.

This subsystem will also make automated calendar and suspense tools available to managers and members of their staff.

2.4 SCIENTIFIC AND TECHNICAL RESEARCH SUBSYSTEM

Scientists and technical staff will be able to more efficiently create technical reports through the development of a coordinated word processing and text management system. Additionally, the elapsed time from beginning of the edit process to publication will be significantly reduced by the implementation of an automated text management system. The quality of completed text will be equal or superior to that of currently published documents.

This subsystem will also provide scientists and technical staff with direct access to on-line databases available to the AFGL Research Library.

2.5 PROGRAM PLANNNING AND FORECASTING SUBSYSTEM

AFGL managers will have the capability to extract current data and manipulate that data to plan and forecast future program scenarios.

Currently, managers create five-year program projections through manual means. An automated planning and forecasting capability will be provided to reduce the manual effort and amount of time now required to make near- and long-term projections while improving the accuracy of those projections. The data to be supplied to the forecasting system from the MIS database will reflect the actual program status more accurately than financial data obtained by current methods.

The Program Planning and Forecasting Subsystem will provide the capabilities and tools to track large-scale programs and to determine forecasts and trends based on the data supplied from the MIS database. This subsystem will also provide decision support tools to assist management in planning the AFGL Work Program for future years.

SECTION 3

SYSTEM ARCHITECTURE

The MIS system architecture at this point is a collection of known, anticipated and as-yet unknown components. (Refer to Figure 1 for a diagram of a view of the proposed system architecture.) This section presents an initial view of the MIS architecture based upon the operational functions and automation requirements defined in the AFGL MIS Study and the system architecture that is currently in place at AFGL. The status of each hardware and software component is also included.

Based on the initial MIS analysis and statement of requirements that were defined during the MIS Study, a set of hardware capabilities, software tools, and applications software that will be required to complete the MIS has been defined. Required hardware that is not currently available will be procured off-the-shelf. Software tools or applications software that are needed will be purchased commercially or developed in-house.

3.1 ASSUMPTIONS

The following assumptions have been made concerning the anticipated MIS system architecture:

- MIS functions will run primarily on one or more DEC VAX-11/780 computers. Certain functions may possibly operate on other hardware and interface to the MIS data residing on the VAX-11s;

- A DBMS running on the VAX-11s will manage the MIS data;

- The AFGL LAN will be used for all communication between mainframes and terminals throughout the complex;

- According to currently available information, the Local On-line Network System (LONS) will interface with the AFGL system architecture and communication network that is in place when LONS is installed at AFGL. LONS will not be considered as part of the MIS architecture at the present time.

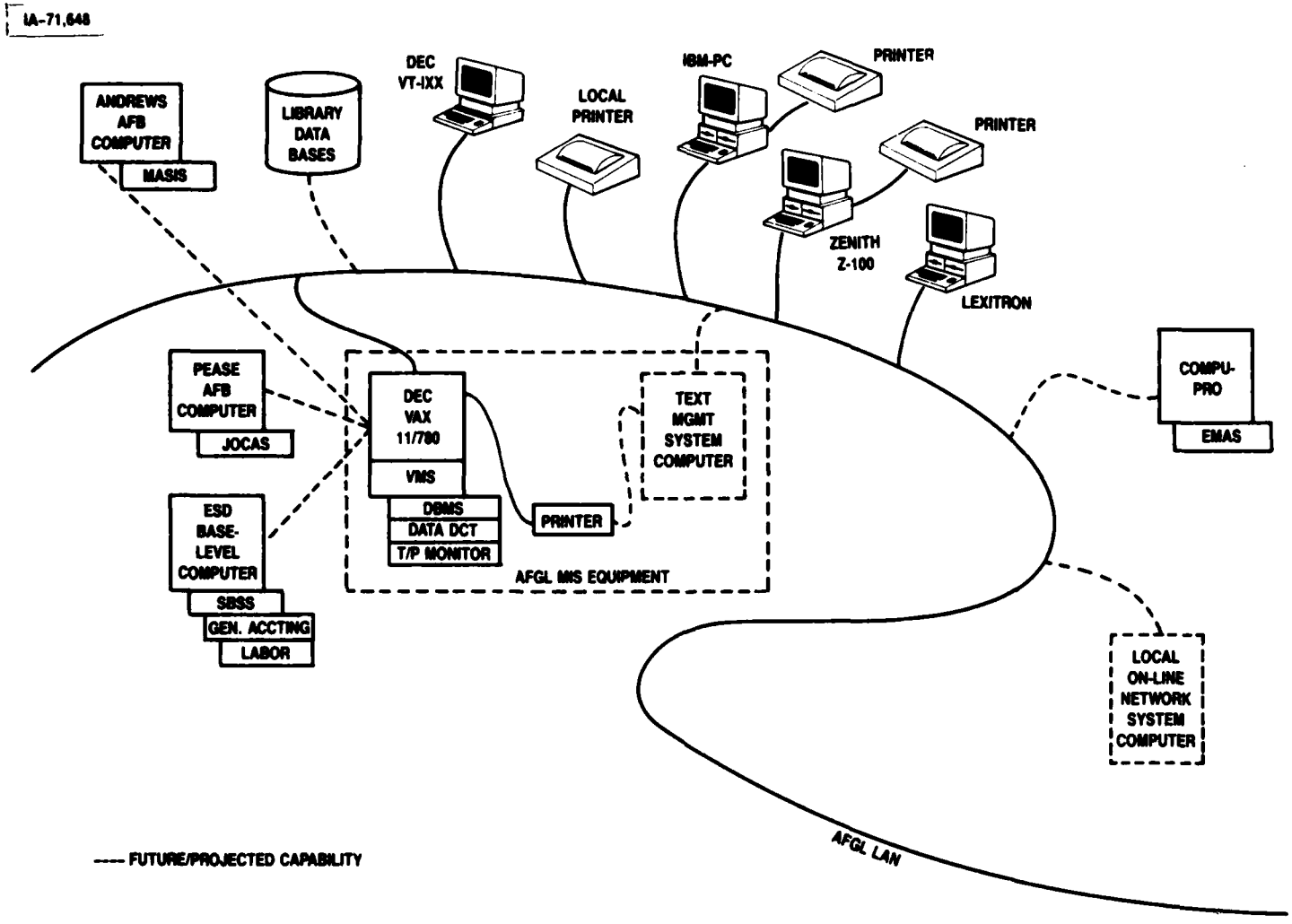


Figure 1. PROPOSED AFGL MIS SYSTEM ARCHITECTURE

3.2 HARDWARE

The hardware configuration for the MIS (Figure 1) incorporates dumb and intelligent terminals communicating with the VAX-11s via the LAN. Also, the VAX-11s will interface with other computers through the LAN and through tape processing.

3.2.1 Mainframes

The AFGL MIS will operate on AFGL VAX-11 computers located in the RM Division Computer Center. Certain functions may require other hardware -- for example, a text management system -- that would interface to the VAX-11s.

3.2.2 Terminals

On-line access will be provided via full-screen editing terminals of the DEC VT-1xx class, communicating via the AFGL LAN. Additionally, Zenith Z-100 and IBM PCs will be used as on-line access terminals via the AFGL LAN.

3.2.3 Personal Computers

The IBM PC and the Zenith Z-100 PC, in addition to being used as terminals, will execute certain MIS functions. To support this operation the capability to download data fom the mainframe to a PC and upload data from the PC to the mainframe will be required. Currently, several IBM PCs and Zenith Z-100 PCs operate at AFGL in a stand-alone mode.

Communications drivers, communications protocols and related software must be installed to permit the transfer of data between PCs and the mainframe.

3.2.4 Printers

Printers will be located at the AFGL Computer Center and distributed locally throughout the complex. Local printers will support a number of terminals and PCs as well as mainframe output. Graphics plotters will be available to support graphics applications.

3.3 COMMUNICATIONS

3.3.1 Internal Communications

Communication between the MIS hosts, terminals and peripherals will be accomplished via the AFGL LAN. The pilot LAN is operational; the fully operational LAN is scheduled for installation in FY85.

3.3.2 External Communications

Requirements must be defined for interfaces between the AFGL MIS and JOCAS, MASIS, EMAS, Standard Base Level Accounting System and SBSS.

Communication will be required to provide end users with access to the on-line library databases currently accessed by the AFGL Research Library.

3.4 SYSTEM AND SUPPORT SOFTWARE

3.4.1 Operating System

The mainframe operating system will be VMS, the current operating system on the DEC VAX-11/780. The operating system for the IBM PC will be PC-DOS and for the Zenith Z-100, MS-DOS.

3.4.2 Database Management System (DBMS)

The DBMS -- ORACLE or INGRES -- that is accepted as the Air Force product division standard will be installed for use in the AFGL MIS.

3.4.3 Data Dictionary

A data dictionary is a central facility that stores data definitions and maintains a directory showing where data is located. It supports such DBMS functions as data definition, loading, userview generation, and access control. The data dictionary will be selected after a decision has been made on the choice of DBMS.

The data dictionary chosen may well be an associated product of the DBMS.

3.4.4 Teleprocessing Monitor

A teleprocessing monitor that provides on-line interactive access to users will be selected to reduce programmer effort and to standardize on-line session development.

3.4.5 High-Level Program Development Language

A high-level program development language will be required for efficient development of applications software. The language associated with the selected DBMS will probably be chosen.

3.5 APPLICATION SOFTWARE

The current application software written in Fortran that processes program financial data at AFGL was developed by Bedford Research Associates, contractors to AFGL, during FY83 and FY84. This activity has addressed automation of the financial tracking and approval process at AFGL -- the first step in developing MIS applications.

VAX-11-based applications developed thus far provide: maintenance of in-house and contractor work unit data, purchase request data, and fund action data; and generation of predefined hard copy reports. Scheduled for future development are applications relating to supply and equipment tracking and approval.

3.6 SOFTWARE TOOLS

Software tools are products that supply generalized capabilities such as electronic mail, word processing, English-like query, or graphics generation. Appropriate tools will be installed to help accomplish the MIS functions.

Numerous word processing systems are currently operating at AFGL. A long range scheme for word processing is being addressed as part of a ten-year evolutionary plan in preparation for AFGL.

Software tools already installed at AFGL include DEC All-in-One office automation package and Supercomp-Twenty, a spreadsheet tool.

3.6.1 English-like Query Language

An English-like query language will be provided, giving users the flexiblity to retrieve data residing on the MIS databases using near-English sentences and sentence fragments without programmer assistance. It is anticipated that this capability will operate on the VAX-11s in conjunction with the database system.

3.6.2 Graphics Aids Package

A software package to allow on-line development of quality graphs, illustrations, and vugraphs will be provided. This package will be used for the on-line creation, storage, retrieval and preparation of transparencies and hardcopy prints of graphic images. It is anticipated that the package will operate on the VAX-11s, PCs, or both.

3.6.3 Document Preparation Capability

A capability to produce camera-ready copy of in-house technical reports, including complex mathematical equations, will be provided. This capabilty will accept documents from the word processing systems via the MIS and the LAN and permit preparation of the document in a form and format suitable for transmission to Base Printing for reproduction.

3.7 EXTERNAL INTERFACES

Timely and accurate passing of program data to the MIS database for access by AFGL managers, administrators and staff is key to the success of the MIS. The following systems will require interfaces to the MIS.

3.7.1 Job Order Cost Accounting System (JOCAS)

The MIS will provide data inputs to JOCAS and receive updated transactions from JOCAS. Currently, keypunched data from manual input sheets is provided to JOCAS on tape. It is anticipated that the MIS will generate the inputs to JOCAS; the data will be transferred by tape or via an electronic interface to JOCAS. This will require development of software to generate the JOCAS inputs in the required format. In addition, the interface method must be defined, the necessary data communication software must be

developed, and the data handling and communications hardware to complete the interface method selected must be acquired.

The interface from JOCAS to the MIS must be defined and implemented. A short-term solution will be to receive a tape of transactions processed by JOCAS and enter them into the MIS. An electronic interface to JOCAS will be analyzed for possible implementation. Modification of JOCAS programs is not anticipated.

3.7.2 Management and Scientific Information System (MASIS)

MASIS data is entered from manual input sheets on a dedicated terminal located in XOR by the XOR staff. The information is stored on a mainframe residing at Andrews AFB. An electronic interface to allow user entry of MASIS data and the exchange of that data from the MIS database directly to MASIS must be defined. Modification of MASIS programs is not anticipated. Some time in the future the Command Management Information System (CMIS) may replace MASIS. If that occurs, the MIS will require an external interface to CMIS.

3.7.3 Equipment Maintenance and Management System (EMAS)

EMAS, installed on a Compupro minicomputer at AFGL in the Research Sciences Division (SU) in FY84, provides supply and equipment (S&E) and inventory information to AFGL. It is anticipated that EMAS will provide requisition tracking, receipt of goods information, shipping information and funds and budget management. An electronic interface must be defined to transfer the above data to the MIS. Modification of EMAS programs is not anticipated.

3.7.4 Standard Base Level Accounting System

Keypunched program financial data, supplied from the ESD Accounting and Finance Office (ESD/ACF), is entered into the Burroughs mainframe located at Pease AFB. The Standard Base Level Accounting System, the general ledger system for AFGL, posts obligations and expenses each month; the results are passed to JOCAS for monthly reporting. Access to the financial data as soon as it is posted will provide AFGL managers with an accurate, timely program financial picture. An electronic interface must be defined to pass data from the Standard Base Level Accounting System to the AFGL MIS. Modification of Standard Base Level Accounting System programs is not anticipated.

3.7.5 Standard Base Level Supply System (SBSS)

The SBSS supplies S&E data to AFGL managers through hard copy reports. An electronic interface must be defined to transfer supply data to the MIS. Modification of SBSS programs is not anticipated.

SECTION 4

PROJECT MANAGEMENT

This section defines the various standards, guidelines, and procedures that will be considered during the design, development, and implementation of the MIS. The RM Director, MITRE and the software development contractor will determine if the standards already in place will satisfy the implementation needs of the MIS. New standards will be defined where applicable.

4.1 CUSTOM SOFTWARE DEVELOPMENT STANDARDS

Design and documentation standards must be in place during the initial stages of the design and development process to ensure commonality among subsystems and capabilities. The standards defined below apply to all custom software development efforts to be undertaken as part of the MIS.

4.1.1 Design Standards

These standards govern development of screens, reports, error reporting, data access, and system access.

4.1.1.1 Screen Standards

Screen standards for all interactive terminal sessions will be followed in the design and development of all in-house custom developed software and in the application of vendor-supplied software tools where screen formatting can be controlled or specified. These standards will be directed toward achieving user-friendly interaction with the application being developed and will take into account screen design limitations based on system hardware, software and communications equipment.

The screen standards will constrain placement of control information, titles, constant information, messages, and screen subject content. The definition of data elements used in displays will be compatible in meaning with all MIS forms and reports.

4.1.1.2 Report Standards

Definition of data elements on all reports that are part of the MIS will be standardized.

4.1.1.3 Data and Systems Access Standards

Standards for controlling user access to data, tools, subsystems and modules will take into consideration the privileged nature of the data, an individual's need for access to the data, the individual's job classification and the functions accomplished by the various tools, subsystems and modules within the MIS.

4.1.2 Documentation Standards

Documentation standards will be followed for the three development processes described in Appendix B. Standard documents will define and describe: procurement of off-the-shelf hardware and software; in-house development of applications software; application of software tools; system maintenance; and user manuals and guides. Vendor-supplied user software manuals will be acceptable for off-the-shelf hardware and software.

4.2 MANAGEMENT GUIDELINES AND PROCEDURES

Management guidelines and procedures will establish management reviews, reports, plans, schedules, and financial data required for the RM Director to ensure cost-effective implementation of the MIS.

4.2.1 Control of Design and Development

These guidelines will establish the checkpoints in the design and development process. Review and approval checkpoints will be determined, the review process will be defined, and change procedures will be established.

4.2.2 Test Controls

These guidelines will define the testing that will be required for each design or development process, including levels of testing, the participants, and the criteria for acceptance of the product being developed or procured.

4.2.3 System Maintenance

Standards for maintenance of custom-developed and vendor-supplied software and hardware will define procedures for handling changes to production software, installation of new versions or changes to vendor-supplied software, updating documentation resulting from changes, and notification and training of users when changes have occurred.

4.2.4 Operational Control

These guidelines will establish procedures for providing assistance to users, reporting operational problems, adding and changing accounts, providing user documentation and normal operation of the MIS.

4.2.5 User Training

User training plays a significant part in the success of the MIS implementation. Training must provide AFGL users with a clear picture of the MIS as a whole and of each implementable application. Training requirements will be defined for each implementable application.

SECTION 5

MIS IMPLEMENTATION TASKS TO BEGIN IN FY85

This section specifies the tasks that have been targeted for work during FY85. The approach is to immediately provide managers with tools to view and manipulate the currently accessible data in a meaningful way and then develop additional applications and capabilities.

AFGL managers can obtain on-line access to data through near-term installation of an English-like query language. This, therefore, will be the initial thrust of the work effort for FY85.

Another major activity will be the conversion of data from current files to run under a new DBMS that AFGL will acquire in FY85. The database can then be augmented with additional files, new system interfaces, and custom software to support new applications.

Implementation of presentation tools -- a major need identified by AFGL managers -- will be addressed during FY85. An analysis of decision support system needs will be performed as well during this fiscal year.

Appendix A contains the schedules of planned activities for tasks that will begin in FY85.

5.1 PROCURE AN ENGLISH-LIKE QUERY LANGUAGE

The MIS will provide AFGL managers with hands-on access -- using an English-like query language to be procured -- to data that reside on the DBMS.

5.1.1 Description

This task provides for procurement of an on-line query language. This capability will allow users having no programming knowledge to query the database asking questions in English. The capability must work on the DEC VAX-11/780, be compatible with the selected DBMS (ORACLE or INGRES,) have a report generation capability and be user friendly. This task will include the following activities: evaluate product availability; select the most appropriate product; and prepare procurement documents for the selected product. Sole source justification may be required, since

Frey Associates' product THEMIS currently appears to be the only vehicle available that operates on the DEC VAX-11.

5.1.2 Products

- Completed Request for Purchase (Form 9);
- Installed product.

5.1.3 Task Responsibilities

MITRE will be responsible for the following tasks:

- Assist in evaluating products and in developing technical portions of procurement documents;
- Assist the software development contractor in testing the installed product.

The RM Division will be responsible for the following:

- Prepare the Request for Purchase;
- Evaluate proposals and negotiate a contract with the vendor.

The contractor will be responsible for the following:

- Install the product on the DEC VAX-11;
- Become proficient in adapting the product to applications.

5.1.4 Resources

RM Division: 2 staff months;

Contractor: 2 staff months.

5.2 IMPLEMENT ENGLISH-LIKE QUERY LANGUAGE APPLICATIONS

5.2.1 Description

This task will involve: selecting applications; developing a lexicon for each application; and linking the lexicon to the database. In addition, user manuals and training materials must be written and users must be trained for each application.

5.2.2 Products

- Application definition documents;
- Lexicon for selected data files;
- Data files.

5.2.3 Task Responsibilities

MITRE will be responsible for the following tasks:

- Producing application definition documents;
- Consultation with contractor on software development, testing, user training and user manuals.

The RM Division will be responsible for:

- Consultation on application definition;
- Review and approval of all documents;
- Provision of training facilities and coordination of user training.

The contractor will be responsible for:

- Lexicon development;
- Linking lexicon to the data files;
- Testing of the application;
- User training;

- Application-specific user manuals;

- System maintenance.

5.2.4 Resources

RM Division: 2 staff months;

Contractor: 6 staff months.

5.3 PROCURE DATABASE MANAGEMENT SYSTEM (DBMS)

5.3.1 Description

The RM Division Director has indicated that AFGL will procure the DBMS that will serve as the standard for the AFSC product divisions, including the Electronic Systems Division.

5.3.2 Products

- Completed Request for Purchase (Form 9).

5.3.3 Task Responsibilities

- RM Division will be responsible for the completion of the Purchase Request (PR) package.

- MITRE will assist when needed.

5.3.4 Resources

RM Division: 2.5 staff months.

5.4 INSTALL AND CONVERT DBMS SOFTWARE

5.4.1 Description

The selected DBMS will be procured and installed on the AFGL DEC VAX-11/780. Certain program data that reside in existing files at AFGL must be converted to the format of the new DBMS. Software will be modified to access data on the DBMS rather than on the existing files. A Data Conversion Specification will be created to govern the data conversion process. An assessment of the impact on software will be required to determine the cost of converting the data.

5.4.2 Products

- Data Conversion Specification;
- Installed DBMS with current program data converted from current data files.

5.4.3 Task Responsibilities

MITRE will be responsible for the following tasks:

- Write the Data Conversion Specification;
- Monitor the conversion process;
- Assist in the operational testing to insure that the conversion has been completed in a satisfactory manner.

The RM Division will be responsible for the following tasks:

- Review and approve the Data Conversion Specification;
- Perform operational testing to insure that the conversion has been completed successfully.

The software development contractor will be responsible for:

- Installation of the DBMS;
- Conversion of data;

- Modification of current software to access data in the DBMS.

5.4.4 Resources

RM Division: 1.5 staff months;

Contractor: 5 staff months.

5.5 AUTOMATE INTERFACES FOR EXISTING APPLICATIONS

5.5.1 Description

This task will define automated interfaces between the MIS and other AFGL systems, such as JOCAS, MASIS, Standard Base Level Accounting and SBSS. The interfaces will be identified and alternatives for providing the most effective transmission of data will be reviewed. The selected alternative will then be implemented.

Scheduling of development and implementation tasks will occur after the alternatives have been reviewed and approved.

5.5.2 Products

- Definition of interfaces and scope of implementation effort;
- Developed interfaces between the MIS and other systems.

5.5.3 Task Responsibilities

MITRE will be responsible for:

- Definition of interface alternatives.

The RM Director will be responsible for:

- Determining the prioritization and scheduling of the interfaces.

The software development contractor will be responsible for:

- Assisting in the definition of interface alternatives;
- Implementing the interfaces.

5.5.4 Resources

RM Division: 2 staff months.

Contractor: 4 staff months.

5.6 INVESTIGATE AND PROCURE PRESENTATION TOOLS FOR AFGL

5.6.1 Description

The initial phase of this task will be to investigate off-the-shelf presentation tools for the DEC VAX-11/780. These tools will encompass vugraph generation, on-line automated presentation tools and graphics capabilities. A second alternative, to use available systems such as those at ESD, will be considered.

If the off-the-shelf package alternative is chosen, a Request for Purchase (Form 9) will be prepared to procure the recommended presentation tools; proposals will be reviewed and the vendor selected; contract negotiations will be completed; and the contract signed.

When the presentation tools capability is installed, standardized formats and a database of presentation data will be selected and loaded. In addition, the users will be trained in the use of the presentation tools capability. When this task is completed the installation will be complete and the system will be operational.

A continuing task will be maintenance of the presentation tools and the associated database.

5.6.2 Products

- A letter recommending which procurement approach, e.g., off-the-shelf procurement or use of the ESD presentation tools, to choose. If the off-the-shelf approach is recommended, the letter will also contain a product recommendation and a Request for Purchase (Form 9) will be completed and processed.

- If use of the ESD presentation tools is selected, AFGL will define how the interface with and use of the ESD presentation tools will be handled. In addition, a letter of agreement with ESD on the use of the ESD presentation tools by AFGL will be developed, coordinated and signed by ESD and AFGL.

- User manuals and maintenance documentation will be developed for either option.

- User training and accompanying training material will be provided.

5.6.3 Task Responsibilities

MITRE will be responsible for the following:

- Evaluate and recommend the approach for procurement of presentation tools. If an off-the-shelf package approach is chosen, MITRE will recommend off-the-shelf packages.

- Assist AFGL in the development of the Request for Purchase (Form 9) for procurement of presentation tools.

- Act as consultant to AFGL in evaluating proposals for the tools.

AFGL will be responsible for the following tasks:

- Choose procurement alternative;

- Select vendor and process procurement documents if an off-the-shelf product is procured.

The software development contractor will be responsible for the following tasks:

- Install the system;

- Prepare training material.

5.6.4 Resources

RM Division: 1.5 staff months;

Contractor: 3.5 staff months.

5.7 DEFINE MIS APPLICATIONS

5.7.1 Description

In this task, applications to be implemented will be defined; the related data required in the DBMS will be identified; and interfaces required to supply the data will be established. This task will be on-going, spanning the implementation of the MIS.

It is anticipated that the FY85 activity may be limited to identification of applications. Scheduling of functional design specifications creation or application development will occur after the applications have been identified.

5.7.2 Products

- Identification of applications to be developed.

5.7.3 Task Responsibilities

MITRE will be responsible for:

- Participation in the identification of applications to be developed with the RM Director and the software development contractor.

The RM Director will be responsible for:

- Participation in the identification of applications to be developed with MITRE and the software development contractor;
- Approval of the scope of applications to be developed.

The software development contractor will be responsible for:

- Participation in the identification of applications to be developed.

5.7.4 Resources

RM Division: 2 staff months;

Contractor: 2 staff months.

5.8 IDENTIFY REQUIREMENTS FOR A DECISION SUPPORT SYSTEM

5.8.1 Description

A functional analysis will be performed to define the scope of a decision support system and the level of automation required to assist the decision support needs, program planning and projections of technical program element funds processes for AFGL top- and middle-level managers.

5.8.2 Products

- Functional Requirements document.

5.8.3 Task Responsibilities

MITRE will be responsible for the following:

- Advise on conduct of the requirements analysis.

The RM Division will be responsible for the following:

- Perform requirements analysis;
- Produce Functional Requirements document.

The contractor will be responsible for the following:

- Assist in requirements analysis, as applicable.

5.8.4 Resources

RM Division: 6 staff months;

Contractor: 2 staff months.

5.9 INVESTIGATE AND DEVELOP MIS STANDARDS

5.9.1 Description

Section 4 of this document specifies standards to be in place during the design, development, implementation and post-implementation support of the MIS. During FY85, standards will be investigated for each phase of the MIS implementation. The standards currently in effect will be evaluated to determine if they are suitable for the MIS. If it will be necessary to develop new or revised standards, discussions involving MITRE, the RM Division and the software development contractor will be held to formulate the standards.

5.9.2 Products

- New or revised documented standards.

5.9.3 Task Responsibilities

MITRE will be responsible for participation in discussions of standards.

The RM Division will be responsible for:

- Participation in discussions of standards;
- Approval of all standards;
- Documentation of approved standards.

The software development contractor will be responsible for participation in discussions of standards.

5.9.4 Resources

Accurate resource projections cannot be made at this time.

LIST OF REFERENCES

1. A. Hayen, "Air Force Geophysics Laboratory Management Information System Study," ESD-TR-85-114, Electronic Systems Division, AFSC, Hanscom Air Force Base, Massachusetts, August 1985.

APPENDIX A

AFGL MIS TASK SCHEDULES FOR TASKS STARTED IN FY85

AFGL MIS TASK SCHEDULE FOR FY85

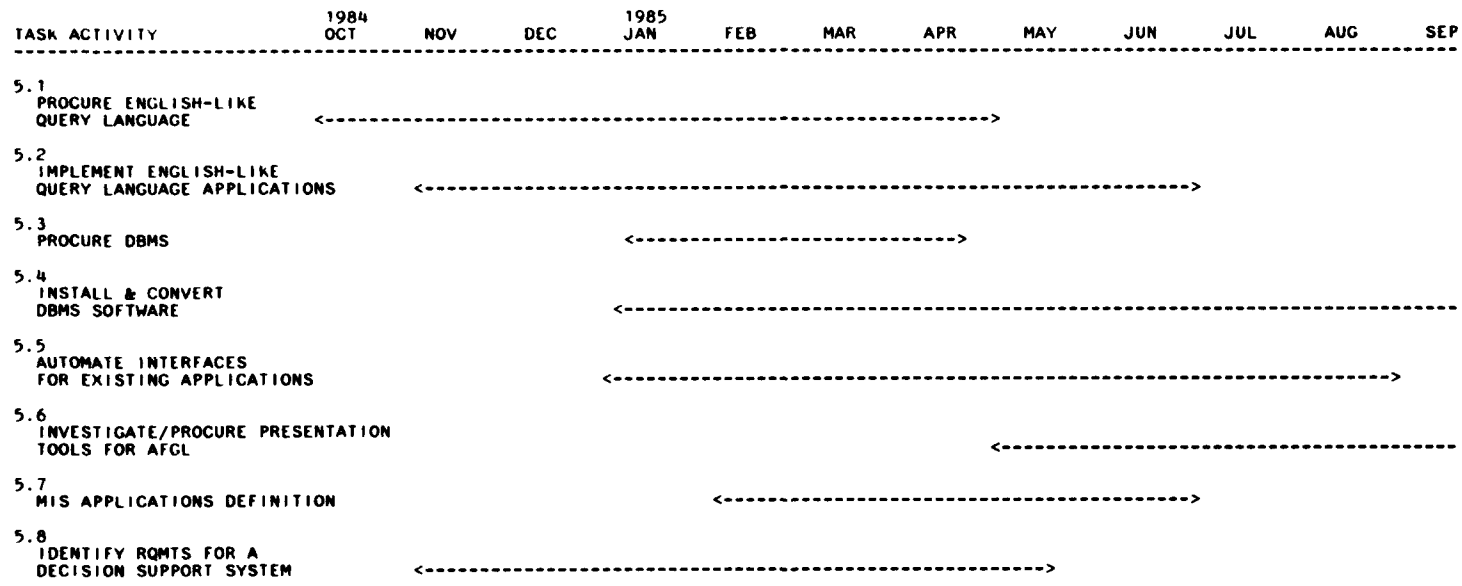


Figure 2. ELAPSED TIME FOR TASK IMPLEMENTATIONS

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5. 1

TASK ACTIVITY	1984 OCT	NOV	DEC	1985 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
EVALUATE AVAILABLE PRODUCTS	V											
RECOMMEND PRODUCT CHOICE		V										
PREPARE PROCUREMENT DOCUMENTS		<--------->										
NEGOTIATE AND AWARD CONTRACT			<---------->									
PRODUCT DELIVERY						V						
INSTALL AND TEST PRODUCT						<==========>						

////////// MITRE TASK

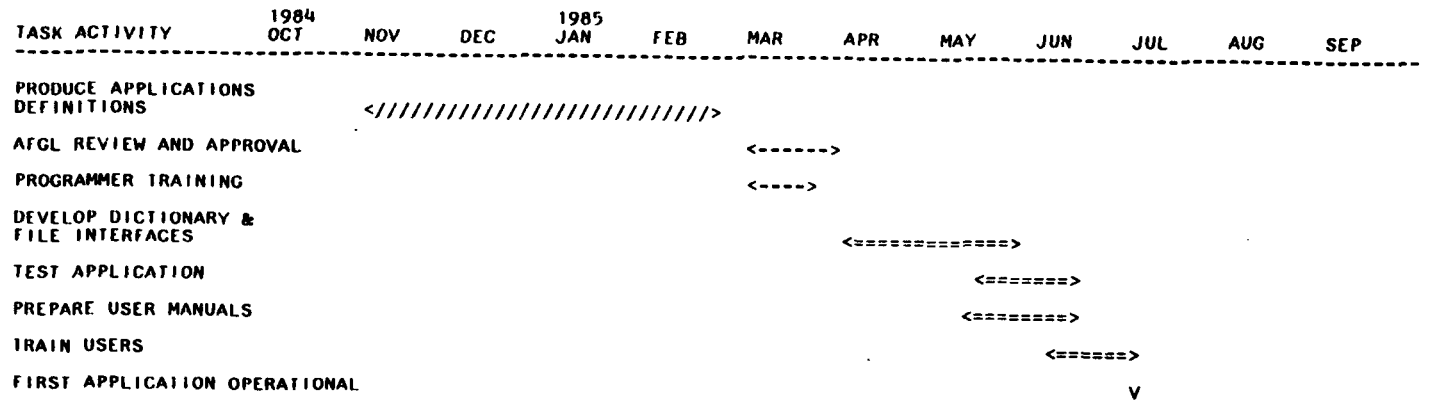
--------- RM TASK

========== CONTRACTOR TASK

FIGURE 3. PROCURE AN ENGLISH-LIKE QUERY LANGUAGE

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.2



//////// MITRE TASK

--------- RM TASK

========= CONTRACTOR TASK

FIGURE 4. IMPLEMENT ENGLISH-LIKE QUERY LANGUAGE APPLICATIONS

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.3

TASK ACTIVITY	1984 OCT	NOV	DEC	1985 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PREPARE PROCUREMENT DOCUMENTS				<----------		>						
NEGOTIATE CONTRACT WITH VENDOR						<------	>					
AWARD CONTRACT							V					
DBMS DELIVERY								V				

//////// MITRE TASK

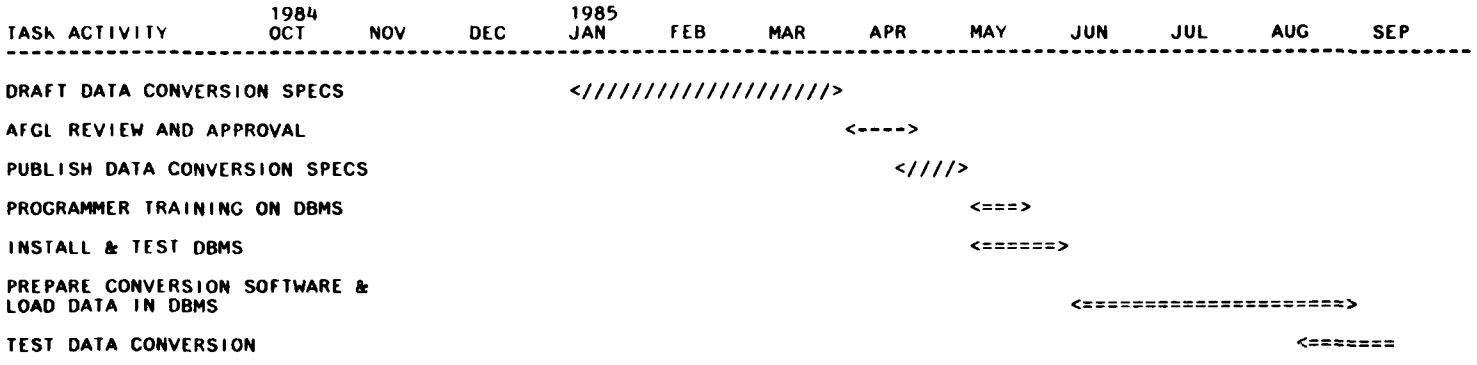
--------- RM TASK

========= CONTRACTOR TASK

Figure 5. PROCURE DATABASE MANAGEMENT SYSTEM

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.4



//////// MITRE TASK

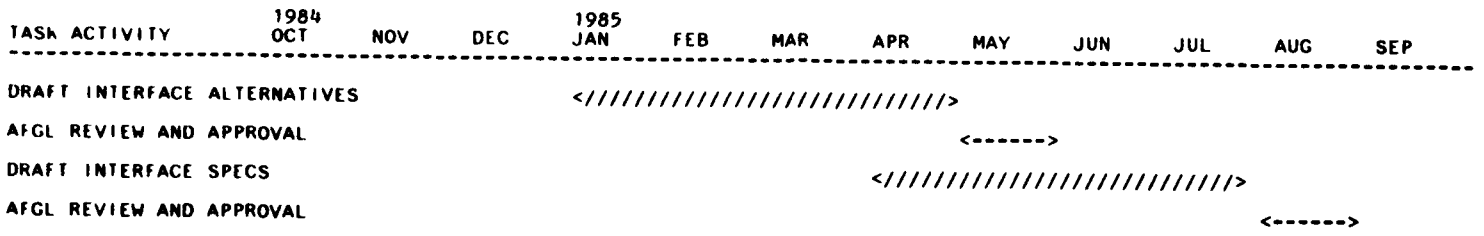
--------- RM TASK

========= CONTRACTOR TASK

Figure 6. INSTALL AND CONVERT DBMS SOFTWARE

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.5



////////// MITRE TASK

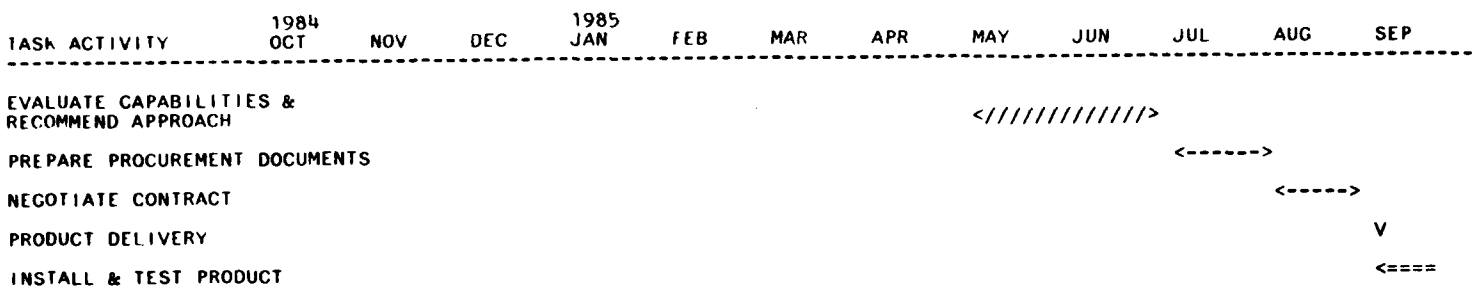
---------- RM TASK

========== CONTRACTOR TASK

Figure 7. AUTOMATE INTERFACES FOR EXISTING APPLICATIONS

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.6



////////// MITRE TASK

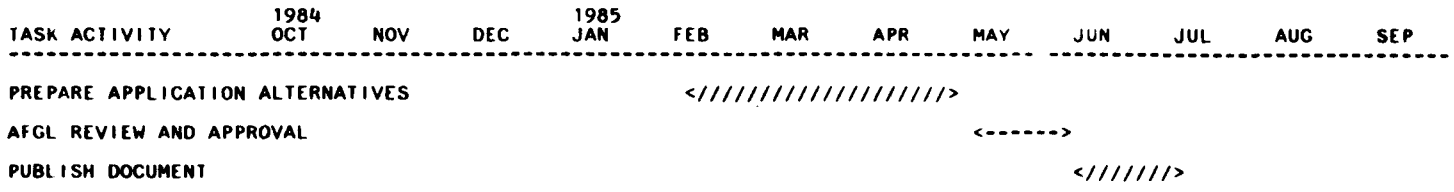
---------- RM TASK

========== CONTRACTOR TASK

Figure 8. INVESTIGATE AND PROCURE PRESENTATION TOOLS FOR AFGL

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.7



////////// MITRE TASK

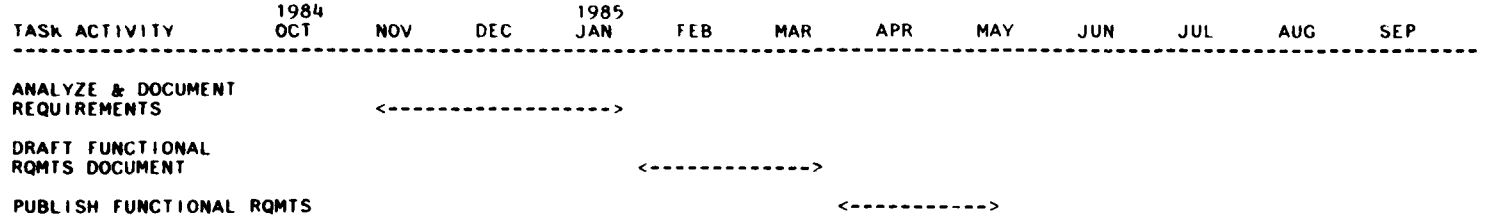
---------- RM TASK

========== CONTRACTOR TASK

Figure 9. Define MIS Application

AFGL MIS TASK SCHEDULE FOR FY85

TASK NO: 5.8



//////// MITRE TASK

--------- RM TASK

========= CONTRACTOR TASK

Figure 10. IDENTIFY REQUIREMENTS FOR A DECISION SUPPORT

GLOSSARY

ADPE	Automated Data Processing Equipment
AFGL	Air Force Geophysics Laboratory
AFSC	Air Force Systems Command
AFSTC	Air Force Systems Technology Center
BRA	Bedford Research Associates
CMIS	Command Management Information System
CWU	Contract Work Unit
DATA DICT	Database Management System Data Dictionary
DBMS	Database Management System
DEC	Digital Equipment Corporation
EMAS	Equipment Maintenance and Management System
ESD	Electronic Systems Division (Air Force Systems Command)
ESD/ACF	ESD Accounting and Finance Office
GEN. ACCTING	Standard Base Level Accounting System
IBM	International Business Machines Corporation
IHWU	In-house Work Unit
JOCAS	Job Order Cost Accounting System
LABOR	Local Labor Reporting System
LAN	Local Area Network
LMCA	Laboratory Materiel Control Activity
LONS	Local On-line Network System
MAR	Management Assessment Review
MASIS	Management and Scientific Information System
MIS	Management Information System
PC	Personal Computer
POM	Program Objectives Memorandum
PR	Procurement Request
RM	AFGL Information Resources Management Division
S&E	Supplies and Equipment
SBSS	Standard Base Supply System

GLOSSARY (Concluded)

SU	AFGL Research Services Division
SUM	Materiels Services Branch
T/P	Teleprocessing Monitor
TDY	Temporary Duty
TMR	Technology Management Review
VMS	Digital Equipment Corporation VAX VMS Operating System
WU	Work Unit
XO	AFGL Technical Plans and Operations Division
XOR	AFGL Technical Operations Branch
XOP	AFGL Technical Plans Branch

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